

Applicant : Robert C. Sundahl
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Attorney's Docket No.: 10559-438001 / P10655

RF MARKS

Claims 1-22 and 30-38 were pending in the application. Claims 1-22, 30, and 32-38 were rejected of various grounds, and claim 31 was indicated to be allowable if rewritten in independent form. Claims 1 and 30 have been amended. Claim 31 has been cancelled and rewritten in independent form as new claim 39, and new claims 40-42 depend therefrom. Thus, claims 1-22, 30, and 32-42 are currently pending in the application. Applicant thanks the Examiner for allowing the subject matter of claim 31 (rewritten as independent claim 39) and kindly requests reconsideration of all other claims.

Claim Amendments:

Claim 1 has been amended to clarify the conductive line through which heat generated by each of the OLED pixels is dissipated.

Claim 30 has been amended to clarify the electrical interconnection line to which each cathode line is electrically connected.

These amendments add no new matter

Rejections under 35 U.S.C § 102 (Including Independent Claims 1, 17, and 30):

The Examiner rejected claims 1-12, 14, 17, 19-21, 30, and 32-34 under 35 U.S.C. § 102(e) as being anticipated by Roach et al. U.S. Patent No. 6,274,978 ("Roach"). Applicant respectfully submits that the rejected independent claims 1, 17, and 30 each define an invention that is patentable over Roach, as do the rejected dependent claims.

Independent claim 1 is directed to an LED display that includes a back panel comprising a thermally conductive material and a front panel substantially parallel to the back panel. A heat dissipating structure is attached to a surface of the back panel opposite the front panel. The LED display also includes an array of OLED pixels positioned between the front panel and the back panel. A plurality of thermally conductive elements are positioned between the OLED pixels and the back panel and distributed throughout the array of OLED pixels. Each of the thermally conductive elements is positioned between the back panel and a conductive line in thermal contact with one of the OLED pixels. Heat generated by each of the OLED pixels is

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dissipated through the conductive line in contact with the OLED pixel, the thermally conductive elements in proximity to the OLED pixel, and the back panel, and to the heat dissipating structure.

Roach discloses a display formed from light-emitting fibers 100 (also referred to as "ribbons") in a side-by-side construction (Col. 3, lines 22-46). Each fiber 100 has a series of light-emitting elements 150 disposed in a linear (one-dimensional) manner along the fiber 100 (Col. 3, lines 31-34; FIGS. 5, 9A, and 10). Thus, when the fibers 100 are placed side-by-side, a two-dimensional array of light-emitting elements 150 is formed (Col. 3, lines 34-40; FIGS. 2, 9A, and 10).

The Examiner contended that Roach's metal contact 140 is a "cathode line" while rejecting claim 1 but later interpreted each metal contact 140 to be a "cathode contact" while rejecting claim 5. The Examiner's later interpretation of Roach is the only possible correct interpretation—the metal contacts 140 are merely separated, discrete cathode contacts that individually "define the [OLED] pixel geometry" (see FIGS. 5-6; col. 3, lines 53-54; col. 11, lines 36-39). Roach teaches that electric current is passed between anode lines 120 and cathode lines 230 using spaced-apart metal contacts 140 formed at each pixel 150 (see FIG. 5; col. 7, lines 13-25; col. 8, lines 45-52). Contrary to the Examiner's initial interpretation Roach's OLED display, the cathode lines are shown as element 230 (not element 140), and these cathode lines 230 are formed directly on the back panel 210 (i.e., there is no solder bump between the cathode lines 230 and the back panel 210).

Roach does not disclose each and every element of Applicant's invention as set forth in independent claim 1, 17, or 30. As for claim 1, Roach does not disclose an OLED display in which a conductive line is in contact with an OLED pixel and is part of the heat dissipation path from the OLED pixel through the back panel, as is required by claim 1. Contrary to the Examiner's interpretation of Roach, the element 140 is a separate, spaced-apart, discrete metal contact that is not a "conductive line." Thus, Roach does not anticipate Applicant's invention as set forth in independent claim 1 and dependent claims 2-16. Neither does Roach render claim 1 obvious. Applicant's OLED display configuration of claim 1—where a conductive line in contact with an OLED pixel is part of the heat dissipation path from the pixel through the back panel—yields advantages not present in, or suggested by, Roach. Namely, as disclosed in

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Applicant's specification (see, e.g., page 7, line 12 to page 8, line 6), the OLED display configuration offers electrical advantages (e.g., a reduction in circuit parasitics) and heat dissipation advantages. If separate and discrete contacts are used rather than a conductive line, the benefits described in Applicant's specification may not be fully realized. Accordingly, Roach does not render obvious the invention set forth in independent claim 1 and dependent claims 2-16.

Regarding claim 17, Roach does not disclose an OLED display in which each solder joint in an array of solder joints is positioned between the back panel and either an anode line or a cathode line. Applicant respectfully submits that the Examiner was incorrect when stating that each solder bump 232 in Roach is positioned between the back panel 210 and a cathode line (see FIG. 5, which shows that line segment 230—not metal contact 140—is the cathode line of Roach's display). As described above, Roach does not contemplate the electrical and heat dissipation advantages disclosed in Applicant's specification, nor does Roach suggest any modifications to the prior art device so as to achieve those advantages. Accordingly, Roach does not anticipate nor render obvious the invention set forth in independent claim 17 and dependent claims 18-22.

Regarding claim 30, Roach does not contemplate that each cathode line is electrically connected to a corresponding electrical interconnection line of the back panel by thermally conductive elements formed at each OLED pixel. According to Roach, the cathode lines 230 are formed directly on the back panel 210, so one skilled in the art would not use a solder bump to connect such a cathode line 230 to some other electrical connection line formed on the same back panel 210. Furthermore, Roach does not suggest that a cathode line may be used in place of, or in addition to, the metal contacts 140, and Roach does not suggest advantages that may be realized from such a construction. Rather, one must refer to Applicant's specification to infer the potential benefits of the OLED display set forth in claim 30. As such, Roach does not anticipate nor render obvious the subject matter of independent claim 30 and dependent claims 32-34.

Accordingly, independent claims 1, 17, and 30 each define an invention that is patentable over Roach, as do dependent claims 2-16, 18-22, and 32-34.

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Rejections of dependent claims 13, 16, 18, and 22 under 35 U.S.C. § 103:

The Examiner rejected dependent claims 13, 16, 18, and 22 under 35 U.S.C. § 103(a) as being unpatentable over Roach, either alone or in combination with Patel U.S. Patent No. 5,396,403 ("Patel"). As discussed above, Roach does not render Applicant's independent claims 1 and 17 obvious. In addition, the Patel reference cited in connection with claims 16 and 22 does not supply the missing teachings so as to render either independent claim 1 or 17 obvious, and the Examiner has not contended that Patel supplies the missing teachings. Accordingly, dependent claims 13 and 18 are each patentable over Roach, and dependent claims 16 and 22 are each patentable over the combination of Roach and Patel. Applicant respectfully requests that the Examiner removes her rejections of these claims.

Rejections of claims 35-38 under 35 U.S.C. § 103:

The Examiner also rejected claims 35-38 under 35 U.S.C. § 103(a) as being unpatentable over Roach. Applicant submits that independent claim 35 is not rendered obvious by the teaching of Roach.

Claim 35 is directed to an OLED display that includes a back panel having at least one electrical interconnection line and a front panel that is substantially parallel to the back panel. The OLED display also includes an array of OLED pixels positioned between the front panel and the back panel. The array of OLED pixels has at least one centrally located OLED pixel that is formed at a non-edge location of the array, and the centrally located pixel has an anode contact located at the non-edge location. The OLED display further includes a thermally conductive element on the anode contact at the non-edge location. The thermally conductive element electrically connects the anode contact and the electrical interconnection line of the back panel.

Regarding claim 35, the Examiner contended that Roach discloses an OLED display having solder bumps 234 to connect anode lines 120 with the back panel circuitry 228, but Roach discloses using such solder bumps 234 only at edge locations. Nevertheless, the Examiner contended that "[i]t has been held that rearranging of parts of an invention involves only routine skill in the art." The Examiner provided no support for this statement of law.

Roach, as conceded by the Examiner, does not disclose a thermally conductive element on an anode contact located at a non-edge location. Neither does Roach render this feature of the

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Applicant's invention obvious. As described in Applicant's specification (*see, e.g.*, page 7, line 12 to page 8, line 6), this feature provides benefits not suggested by Roach.

Applicant submits that claim 35 is not simply a rearrangement of parts that is within the skill in the art. Moreover, Applicant submits that the Examiner misstated the law in support of her rejection.

The Examiner stated “[i]t has been held that rearranging of parts of an invention involves only routine skill in the art.” This is not fully true. The applicable rule was concisely stated by the United States Board of Patent Appeals and Interferences:

The mere fact that a worker in the art could rearrange the parts of the reference device to meet the terms of the claims on appeal is not by itself sufficient to support a finding of obviousness. The prior art must provide a motivation or reason for the worker in the art, without the benefit of [Applicant's] specification, to make the necessary changes in the reference device.

Ex Parte Chicago Rawhide Mfg. Co., 223 U.S.P.Q. 351, 353 (Bd. Pat. App. & Inter. 1984). The Federal Circuit precedent is consistent with this rule and requires a suggestion from the prior art for the worker to modify the prior art device. *In re Kotzab*, 217 F.3d 1365, 1369-70 (Fed. Cir. 2000) (“Most if not all inventions arise from a combination of old elements. . . . Even when obviousness is based on a single prior art reference, there must be a showing of a suggestion or motivation to modify the teachings of that reference.”); *Northern Telecom, Inc. v. Datapoint Corp.*, 908 F.2d 931, 935 (Fed. Cir. 1990) (“Whether the changes from the prior art ‘minor’ . . . , the changes must be evaluated in terms of the whole invention, including whether the prior art provides any teaching or suggestion to one of ordinary skill in the art to make the changes that would produce the [claimed invention].”). Thus, the mere fact that the parts can be rearranged is not enough. There must also be a teaching in the prior art to suggest such a rearrangement. There is no such suggestion here, either in Roach or in any other prior art. As discussed above, Applicant's configuration provides benefits not present in Roach, and there is no suggestion to alter Roach to achieve the benefits disclosed in Applicant's specification.

Accordingly, claim 35 defines an invention that is patentable over Roach, as do dependent claims 36-38. As such, Applicant asks that the Examiner removes her rejections of these claims.

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Added Claims 39-42:

The Examiner objected to claim 31 as depending from a rejected base claim and noted that it would be allowable if rewritten in independent form. Applicant has added claim 39, which is cancelled claim 31 rewritten in independent form, with the addition of the same clarification that was made in connection with claim 30 (described above). Added dependent claims 40-42 are similar to dependent claims 32-34. These added claims 39-42 add no new matter.

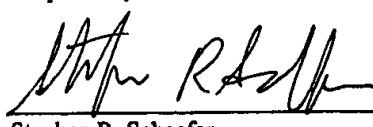
Applicants submit that independent claim 39 is now in condition for allowance, as are dependent claims 40-42.

CONCLUSIONS

Applicants submit that pending claims 1-22, 30 and 32-42 are in condition for allowance and request that the Examiner issue a Notice of Allowance. No fee is believed due for this Amendment. Please apply any other charges or credits to deposit account 06-1050.

Respectfully submitted,

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